REMARKS

The Office Action rejects claims 1-5 under 35 U.S.C. 102(b) as anticipated by Nordell et al., claims 6 and 12 under 35 U.S.C. 103 as obvious in view of Nordell, claims 7 and 8 under 35 U.S.C. 103 as obvious in view of Nordell and Goela, and claims 9-11 under 35 U.S.C. 103 as obvious in view of Nordell and Anderson. Independent claim 1 has been amended to add the limitations of claims 9 and 12, and to specify that the deposition rate with a gradient is enhanced over an isothermal environment. Applicants believe that amended claim 1 and the remaining dependent claims distinguish over the cited art for the reasons discussed below.

Nordell addresses an entirely different issue than the present invention, and does not teach or suggest the present invention. Nordell heats the substrate to a higher temperature than the adjacent wall and susceptor in order to prolong the life of the vessel and susceptor. See Nordell at col. 1, lines 45-58; col. 4, lilnes 9-14.

While Nordell uses the term "gradient", Nordell in fact teaches a temperature difference between the wall and substrate which reduces mass transfer from the substrate to the wall. A temperature difference (Δ°C) is quite different from a gradient which is a rate of change of temperature over a distance, for example Δ°C/inch. Nordell does not specify a distance between the deposition surface of the substrate 1 and the surface of the wall 7. The purpose of the temperature difference in Nordell is to minimize heating of the wall 7 surface so as to minimize the transport of SiC from the wall 7 which would deplete a protective SiC coating on the wall 7. See col. 3, lines 43-45. In considering the objective of Nordell, those skilled in the art would focus only on temperature differential between the substrate and the adjacent wall. This encourages a larger distance between the wall 7 and the substrate, which would in fact lower the temperature gradient, not increase it. In other words, Nordell tends to teach away from a large gradient.

Claim 1 as amended distinguishes over Nordell by specifying a gradient (50°C-100°C/inch), while Nordell only teaches a temperature differential. Applicants have discovered that a gradient significantly enhances deposition rates when a process gas is injected across the surface of the substrate. Claim 1 is further amended to specify such injection resulting in a process with enhanced deposition rates. Nothing in Nordell suggests this enhancement, and the subject matter now claimed in amended claim 1 is not taught or suggested by Nordell alone or in combination with the other cited references.

In summary, Nordell teaches a method and apparatus that uses a temperature differential to ensure that mass transport in a process chamber is from the substrate to the chamber wall and susceptor, rather than the reverse, in which the coatings of the wall and susceptor will be depleted. In contrast, the present invention as now claimed uses a temperature gradient with injectors that concentrate process gases near the substrate surface to provide enhanced deposition rates on the substrate over those obtained in isothermal environments.

CONCLUSION

Applicants have amended independent claim 1 to distinguish over the cited references. Applicants believe the amended claims are now allowable.

If any further questions arise prior to Notice of Allowance, the Examiner is invited to contact the attorney at the number set forth below.

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CERTIFICATE OF MAILING

I certify that the enclosed papers are being deposited with the U. S. Postal Service as first class mail in an envelope addressed to: MS FEE AMENDMENT, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22202-3514 on December 2, 2003, by Diana Dearing.